

REMARKS

Claims 1, 4-10, 13-21, and 24-24 are now pending in the Application. Claims 1, 4, 8, 10, 13, 19, and 24 have been amended. Claims 2, 3, 11, 12, 22, and 23 have been cancelled. Claims 29-34 are newly added. The specification has been amended to specifically make reference in the detailed description of the invention to the features of claims 4, 13, and 24. No new matter has been added.

Initially, Applicant has included herewith a copy of the previously submitted PTO-1449 form. This PTO-1449 form together with copies of the references cited were submitted in a Information Disclosure Statement filed on April 17, 2002. In the March 5, 2002 Official Action, Applicant did not receive a copy of the above-identified PTO-1449 form with the Examiner's initials indicating that the references were considered. Applicant also notes that the Official Action contains a PTO-1449 form that appears to be from an unrelated case (U.S. Appln. Serial No. 09/975,264).

Independent claim 1 has been amended to include the features of dependent claims 2 and 3. In addition, independent claim 8 has been amended to include the features of dependent claims 11 and 12. Likewise, independent claim 19 has been amended to more particularly recite the features of dependent claims 22 and 23. Applicant submits that the prior art of record does not disclose or suggest at least the claimed feature now found in independent claims 1, 8, and 19 wherein a MEMS apparatus includes a plurality of anchors having a plurality of anchor legs, wherein each anchor has a first number of anchor legs oriented along a first direction and a second number of anchor legs oriented along a second direction such that the first number of anchor legs are stronger and longer than the

second number of anchor legs.

Claims 29-34 have been added to the Application. Claim 29 recites a MEMS anchor system for securing a base of an MEMS device to a substrate. A plurality of anchors secure the base of the MEMS device to the substrate. Each anchor includes a plurality of anchor legs, each anchor leg being attached at one end to the base of the MEMS device and at the other end to the substrate. Each anchor has a plurality of legs oriented in a first direction and a plurality of legs oriented in a second direction. The plurality of legs oriented in the first direction have a longer length and a greater thickness than the plurality of legs oriented in the second direction. Support for new claim 29 can be found, for example, on page 6, lines 3-19 of Applicant's specification. Claims 30-31 have been added and recite particular orientations of the anchor legs having longer lengths. In claim 30, the anchor legs having the longer lengths are oriented parallel to the direction of the beam. See e.g., Fig. 1A. In claim 31, the anchor legs having the longer lengths are oriented perpendicular to the beam. See e.g., Fig. 6(f).

Newly added claims 32-33 recite a method of forming a MEMS structure. Support for these new claims can be found on page 5, lines 6-18 of Applicant's specification and Figs. 2(a)-2(f). No new matter has been added.

Newly added claim 34 recites a MEMS anchor system for securing a base of a MEMS device to a substrate. The system includes a plurality of anchors securing a base of the MEMS device to the substrate, each anchor including a plurality of anchor legs, each anchor leg being attached at one end to the base of the MEMS device and attached at another end to the substrate, the plurality of anchor legs having a geometric shape selected

from the group consisting of hexagonal, octagonal, elliptical, crosses, and circles. Support for the various claimed anchor geometries can be found, for example, on page 10, lines 7-9 (hexagonal and octagonal anchors), page 10, lines 14 – page 11, line 2 (cross, elliptical, and circular anchors).

In the March 5, 2003 Office Action, the drawings were objected to for allegedly failing to show certain features of the claimed invention. First, the drawings were objected to for failing to show the claimed feature of a first number of anchor legs having a greater strength and length than a second number of anchor legs. Applicants submit, however, that this feature is indeed shown in the drawings. As seen, for example, in Figs. 1A, 1B, and 1C, each anchor (30) has a plurality of legs (32). Two of the legs (those in the direction of arrow B) are longer than the remaining two legs (those in the direction of arrow C). The fact that the longer legs are also stronger can be seen from the comparison between Fig. 1B (which shows some legs having poor step coverage) and Fig. 1C (which shows legs with good step coverage).

The drawings were also objected to for failing to show the feature of anchor legs oriented along a first direction having a length that is at least twice the length of a second number of anchor legs. This feature can be seen in Figs. 1A, 3C, 4, 6(b), 6(c), and 6(f) which shows rectangular-shaped anchors having lengths which are significantly longer than their widths. Finally, the drawings are objected to for failing to showing the feature that each anchor comprises a plurality of anchor legs with each leg being attached at one end to the substrate and at the other end to the base. Applicant submits that this feature can be seen in Figs. 1B and 1C which shows the plurality of anchor legs (32) attached at one end

to a substrate (35) and at the other end to the base (25) (Fig. 1B).

Claims 1-18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the Sherman publication ("Sherman"). In addition, claims 19-28 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Sherman in view of U.S. Patent No. 6,307,452 (Sun). Applicant submits that the above-noted claim amendments obviates these rejections. Independent claims 1, 8, and 19 all recite a MEMS apparatus that includes, *inter alia*, a plurality of anchors having a plurality of anchor legs, wherein each anchor has a first number of anchor legs oriented along a first direction and a second number of anchor legs oriented along a second direction such that the first number of anchor legs are stronger and longer than the second number of anchor legs. Sherman and Sun fail to disclose or otherwise suggest this feature.

As stated in Applicant's specification, there are several benefits provided by the claimed anchor system. First, the combined strength of multiple anchors can be significantly greater than the strength of a traditional large anchor without requiring a larger base area than a traditional anchor. Even more important, however, is that the present claimed invention addresses the problem inherent in the metal deposition process in which vertical side-wall step coverage is typically more effective in one direction than in other directions. The present invention capitalizes on this phenomena such that the thicker or stronger anchor legs with good side-wall step coverage (i.e., legs (32) with length l_B in Fig. 1C) are made longer than the anchor legs with poor side-wall step coverage (i.e., legs (32) with length l_C in Fig. 1C). In one preferred embodiment, the anchors (30) thus have the shape of rectangles as is shown, for example, in Fig. 1A.

One advantage of this claimed feature is that the combined length of the anchor legs (32) of the anchors (30) can be significantly greater along the direction of good side-wall step coverage than a traditional large anchor occupying the same area. With reference to Fig. 1A, the combined length of the anchor legs (32) for each base (25) along the direction of good side-wall step coverage (direction B) is $18 l_B$. In contrast, the combined length of the anchor legs of a single traditional large anchor occupying the same area as the multiple anchors (30) for one base (25) would be only approximately $2 l_B$ (along direction B). Specification, page 6, line 22 – page 7, line 11. Consequently, the combined strength of the multiple anchors is significantly greater than the strength of a traditional large anchor without requiring a larger “footprint” than the traditional anchor. Specification, page 7, lines 7-9.

Applicants submit that the currently pending claims are allowable over the art of record. A notice of allowability is respectfully requested.

Respectfully submitted,

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